Computer-Aided Technology - Unmanned Vehicle System (AAS)

Associate in Applied Science

Minimum of 60 credit hours

The Unmanned Vehicle System (UVS) Option will equip students with the skillset required to operate ground, aerial, and marine vehicles. Students will receive hands-on experience in the classroom and in the field. Students will learn how to fly safely in the National Airspace while abiding by current regulations. With the use of 3D fabrication equipment, students will have the opportunity to design attachments and accessories for these systems. The potential commercial uses of unmanned vehicle systems are endless, to include aerial photography and video, search and rescue, disaster response, digital mapping, photogrammetry, remote sensing and many others.

Course Sequence

<table>
<thead>
<tr>
<th>Course ID</th>
<th>Course Name</th>
<th>Credits</th>
<th>Type</th>
<th>Min Gd</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Suggested Freshman 1st Semester</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCL 1001</td>
<td>Success in College and Life</td>
<td>1</td>
<td>Life Skills</td>
<td></td>
</tr>
<tr>
<td>CAT 1113</td>
<td>Unmanned Vehicle Systems</td>
<td>3</td>
<td>Major</td>
<td></td>
</tr>
<tr>
<td>CAT 1133</td>
<td>Airspace and Regulations</td>
<td>3</td>
<td>Major</td>
<td></td>
</tr>
<tr>
<td>CS 1103</td>
<td>Introduction to Computers and Applications</td>
<td>3</td>
<td>Major</td>
<td></td>
</tr>
<tr>
<td>ENGL 1113</td>
<td>English Composition I</td>
<td>3</td>
<td>Gen Ed</td>
<td></td>
</tr>
<tr>
<td>MATH 1483</td>
<td>Functions and Modeling*</td>
<td>3</td>
<td>Gen Ed</td>
<td></td>
</tr>
<tr>
<td><strong>Suggested Freshman 2nd Semester</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAT 1214</td>
<td>UVS Operations</td>
<td>3</td>
<td>Major</td>
<td></td>
</tr>
<tr>
<td>CAT 1313</td>
<td>Computer Aided Design (CAD)</td>
<td>4</td>
<td>Major</td>
<td></td>
</tr>
<tr>
<td>MATH 1613</td>
<td>Introduction to Geographic Information System (GIS)</td>
<td>3</td>
<td>Major</td>
<td></td>
</tr>
<tr>
<td>CAT GEN COMM</td>
<td>OSRHE Approved Gen Ed Communications or English Course</td>
<td>3</td>
<td>Gen Ed</td>
<td></td>
</tr>
<tr>
<td><strong>Suggested Sophomore 1st Semester</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAT 123</td>
<td>Introduction to Spatial Technology</td>
<td>3</td>
<td>Major</td>
<td></td>
</tr>
<tr>
<td>CAT 2123</td>
<td>Digital Fabrication</td>
<td>3</td>
<td>Major</td>
<td></td>
</tr>
<tr>
<td>HIST 1483</td>
<td>U.S. History to 1877</td>
<td>OR</td>
<td>Gen Ed</td>
<td></td>
</tr>
<tr>
<td>HIST 1493</td>
<td>U.S. History 1877 to Present</td>
<td>3</td>
<td>Gen Ed</td>
<td></td>
</tr>
<tr>
<td>FA UVS SUPP ELEC</td>
<td>UVS Faculty Approved Support Electives</td>
<td>6</td>
<td>Support</td>
<td></td>
</tr>
<tr>
<td><strong>Suggested Sophomore 2nd Semester</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAT 2924</td>
<td>Design Project</td>
<td>4</td>
<td>Major</td>
<td></td>
</tr>
<tr>
<td>CS 1143</td>
<td>Beginning Programming</td>
<td>3</td>
<td>Major</td>
<td></td>
</tr>
<tr>
<td>POLSC 1113</td>
<td>American Federal Government</td>
<td>3</td>
<td>Gen Ed</td>
<td></td>
</tr>
<tr>
<td>FA UVS SUPP ELEC</td>
<td>UVS Faculty Approved Support Electives</td>
<td>3</td>
<td>Support</td>
<td></td>
</tr>
</tbody>
</table>

Course Grouping

Major Courses: (32 credit hours) Computer-Aided Technology: CAT 1113, CAT 1123, CAT 1133, CAT 1214, CAT 1313, CAT 1323, CAT 2123, CAT 2924, CS 1103, CS 1143

General Education Courses: (18 credit hours)

English: ENGL 1113, *Any course that meets Oklahoma State Regents for Higher Education requirements for a general education Communications; (OSRHE: ENGL 1213, ENGL 1233, COM 1123, COM 2213)

History: HIST 1483 or HIST 1493

Mathematics: MATH 1483, MATH 1613

Political Science: POLSC 1113

Life Skills Courses: (1 credit hour) Life Skills: SCL 1001

Support Courses: (9 credit hours)

Electives: Any CAT, CS, DCP or ENGR course. Any courses from DMD list: DMD 1153, DMD 2143, DMD 2153, DMD 2163, DMD 2253, DMD 2533, DMD 2633, DMD 2733, DMD 2783. Other courses may be approved by the Program Faculty.

Program Notes

Notes: This Technical and Occupational program is designed to prepare students to enter the job force following completion. See Technical and Occupational Programs in the general information section of the catalog.
CAT 1113 - Unmanned Vehicle Systems
Prerequisites: Math 0103 or adequate math placement; ENGL 0203, adequate placement score, or by meeting determined placement measures
3 Credits Students will be introduced to the history, missions, capabilities, types, configurations, subsystems, and the disciplines needed for UVS development and operation.

CAT 1123 - UVS Operations
Prerequisites: CAT 1113
3 Credits Students will demonstrate the proper way to operate Unmanned Vehicle Systems. This includes pre-mission check list, missing planning and logging, safety/liability consideration and emergency procedures. Students will be working in the field and in the classroom conducting simulated and real life missions.

CAT 1133 - Airspace and Regulations
Prerequisites: Math 0203 or adequate math placement; ENGL 0203, adequate placement score, or by meeting determined placement measures
3 Credits The course will examine the components and objectives of the National Airspace System. Emphasis will be placed on regulations pertaining to UAS flight operations.

CAT 1214 - Computer Aided Design
(CAD)
Prerequisites: Math 0103 or adequate math placement; ENGL 0203, adequate placement score, or by meeting determined placement measures
4 Credits The student will learn and demonstrate the proper use of computer-aided design software as a design tool in fields such as Engineering, Architectural and Multimedia. Emphasis will be on computer-aided design fundamentals such as creating, editing and printing of 2D computer-aided design documents. The student will demonstrate his or her understanding of the structure, use and development of computer-aided design documents by correctly creating, using and storing computer-aided design documents. This course satisfies the computer proficiency requirement.

CAT 1313 - Introduction to Geographic Information System (GIS)
Prerequisites: Math 0103 or adequate math placement; ENGL 0203, adequate placement score, or by meeting determined placement measures
3 Credits Students will be introduced to introductory content on typical business and technical applications, data, software, and techniques used to accomplish GIS projects. Students receive hands-on experience with global positioning system (GPS) hardware and ArcGIS software. This course satisfies the computer proficiency requirement.

CAT 1323 - Introduction to Spatial Technology
Prerequisites: Math 0103 or adequate math placement; ENGL 0203, adequate placement score, or by meeting determined placement measures
3 Credits The course focuses on technologies being used to locate, inventory and analyze locations, Geographic Information Systems, Global Positioning Systems, telemetry and photogrammetry and a brief introduction to Satellite-Based Remote Sensing.

CAT 2123 - Digital Fabrication
Prerequisites: MATH 0203 or adequate math placement; CAT 1214 or CAT 1253 or CAT 2543.
3 Credits The course is an in-depth exploration of the world of digital fabrication. Students will create projects by utilizing fabrication equipment such as 3D scanning, 3D Printers, Computer Numerical Control (CNC) machines and metrology tools. This course satisfies the computer proficiency requirement.

CAT 2924 - Design Project
Prerequisites: 15 hours of CAT credits
4 Credits In this capstone course of the Computer-Aided Technology Program, the student will demonstrate the collected knowledge, skills and techniques acquired in the program courses by creating and presenting a representative project to a panel of students, instructors and representatives from industry. The project must be an original design of the student. The project must reflect the standards relative to the project’s nature and the program emphasis. The student must assemble and create components, choose the proper presentation medium, and present the project in a professional manner. This course satisfies the computer proficiency requirement.

CAT GEN COMM - OSRHE Approved Gen Ed Communications or English Course
3 Credits Students should select one 3 credit course: ENG 1213, ENG 1233, COM 1123, or COM 2213.

CS 1103 - Introduction to Computers and Applications
Prerequisites: MATH 0103 or adequate math placement; ENGL 0203, adequate placement score, or by meeting determined placement measures
3 Credits This hands-on course affords students a basic understanding of computers and their application. Upon completion of this course, the student will be able to demonstrate the ability to use a computer operating system, an office suite, productivity tools, as well as the Internet at an introductory level. Advanced Standing is available. This course satisfies the computer proficiency requirement.

CS 1143 - Beginning Programming
Prerequisites: ENGL 0203, adequate placement score, or by meeting determined placement measures; MATH 0313 or adequate math placement or by evaluation. § Criteria for evaluation is in division office.
3 Credits Designed for Computer Science majors, this course affords students a basic understanding of computer programming. Students will utilize accepted programming concepts and perform number system conversions and arithmetic. In addition, they will design and code structured modular programs using design tools such as hierarchy charts, flowcharts, and pseudocode. This course satisfies the computer proficiency requirement.

ENGL 1113 - English Composition I
Prerequisites: ENGL 0203, adequate placement score, or by meeting determined placement measures
3 Credits The student will write well-developed compositions which demonstrate the principles of unity, coherence, and organization and which contain specific details and vivid language. The students will locate library material and incorporate researched materials into compositions.

FA UVS SUPP ELEC - UVS Faculty Approved Support Electives
9 Credits Faculty approved electives: Any CAT, CS, DCP or ENGR course or any of the following DMD courses: DMD-1153, DMD-2143, DMD-2153, DMD-2163, DMD-2253, DMD-2533, DMD-2633, DMD-2733, DMD-2783, and other courses may be approved by the Program Faculty.

HIST 1483 - U.S. History to 1877
Prerequisites: ENGL 0203, adequate placement score, or by meeting determined placement measures
3 Credits After analyzing events in American history from 1400 to 1877 in such areas as revolution, geographic and social mobility, political reform, government precedents and war, students will be able to identify patterns
of present day mobility, describe governmental operations in their society and help resolve conflict in society based on the student's search for change, precedents, and conflict in the American past. A general education requirement.

HIST 1493 - U.S. History 1877 to Present
Prerequisites: ENGL 0203, adequate placement score, or by meeting determined placement measures
3 Credits After analyzing events in American history from 1877 to the present in such areas as geographic and social mobility, political reform, government precedents and war, students will be able to identify patterns of present day mobility, describe governmental operations in their society and help resolve conflict in society based on the student's search for change, precedents, and conflict in the American past. A general education requirement.

MATH 1483 - Functions and Modeling*
Prerequisites: MATH 0313 or adequate math placement; ENGL 0203, adequate placement score, or by meeting determined placement measures
3 Credits The student will demonstrate: an understanding of the general concepts of relation and function and specifically of polynomial, rational, exponential and logarithmic functions; the ability to solve systems of equations by utilizing matrices and determinants; and, the ability to solve practical problems using algebraic and digital techniques. *Pending OSRHE approval

MATH 1613 - Trigonometry
Prerequisites: Pre or Corequisite: MATH 1483 or MATH 1533 or adequate math placement and ENGL 0203, adequate placement score, or by meeting determined placement measures
3 Credits The student will evaluate trigonometric functions and their inverses using both degree and radian measure; graph trigonometric functions and their transformations; identify properties of trigonometric functions; verify and apply trigonometric identities; solve trigonometric equations; solve problems involving right and oblique triangles, vectors, and indirect measurement; and identify and graph polar curves.

SCL 1001 - Success in College and Life
Prerequisites: ENGL 0106 or adequate reading/writing assessment scores
1 Credit Students will learn best practices for academic, career, and personal success. Students will discover their individual strengths, interests, and values to create a personalized plan; select and utilize resources that are applicable to their growth and success; and engage as active and responsible members of the academic community. This course should be taken during a student's first semester of college work at Oklahoma City Community College and is a required course in degree plans to satisfy the Life Skills requirement.